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NOTES ON THE SPECIES OF SCAPHINOTUS DEJEAN INHABITING NORTHEASTERN AMERICA WITH DESCRIPTION OF A NEW SPECIES.

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The tendency of the barrier created by the Allegheny Mountains to separate distinct though closely related species in the tribe Cydrini has already been exemplified in the final separation of *Cydrus germari* and *andrewsi* by Roeschke, and *Cydrus indianæ* and *stenotomus* by Blatchley; a further example of the influence of the same barrier will be found in the variations of *Scaphinotus elevatus*, and in the necessity of separating the eastern and western races of the species heretofore known as *Cydrus* or *Scaphinotus unicolor*.

Scaphinotus was founded by Dejean for *Cydrus elevatus* and *unicolor* and contains those species in which the hind angles of the thorax are so dilated as to project over the base of the elytra. Authors have not agreed as to its standing and in our Check List, based upon Dr. Geo. H. Horn's review of the genus,¹ it is treated as a synonym, but in Dr. Roeschke's paper² the latest and most complete study, embracing the Cydrini of the world, it receives recognition.

The specific names that have been proposed, arranged chronologically, are as follows:

elevatus Fabricius, 1787, Mant. Ins., I, p. 198.

unicolor Fabricius, 1787, Mant. Ins., I, p. 198.

heros Harris, 1839, Bost. Journ., II, p. 196.

flammeus Haldeman, 1844, Proc. Ac. Nat. Sci. Phila., II, p. 54.

dilatatus Leconte, 1853, Trans. Am. Phil. Soc., X, p. 398.

tenebricosus Roeschke, 1907, Mon. p. 141.

besides a number of names for species occurring in Colorado, New Mexico and Arizona that are not within the scope of the present paper.

Of the eastern species *S. elevatus* is by far the best known and the most widely distributed. It is distinguished by its size, 15-23

¹ Trans. Am. Ent. Soc., VII, 1878.

² "Monographie des Carabiden-Tribus Cydrini," Annales Musei Nationalis Hungarici, 1907.

mm., by the slight flattening of the disk of the elytra, the presence of the seta of the posterior coxa, and by the first joint of the male anterior tarsi being spongy pubescent over at least half its under surface.

The range of *S. elevatus* is greatly extended, from Massachusetts to Florida on the Atlantic coast and inland to Missouri and Nebraska, but it varies in many respects and has been subdivided into several subspecies. In the northern Atlantic states one finds the typical *elevatus* with moderately elevated thoracic margins and cupreous elytra; along the coast, especially from Virginia southward, one finds darker colored specimens in which the margins of the thorax are more reflexed and approximated, making the insect look narrower. An extreme example of this tendency was taken by Mr. Geo. P. Engelhardt in the Dismal Swamp, Virginia. The name *unicolor* was formerly applied to this dark narrow form, but erroneously, and Dr. Roeschke has called it *tenebricosus*¹ defining the subspecies as follows: "Completely black or with feeble violet tinge; narrow, compressed form; sides of thorax very broad and greatly elevated with very sharp hind angles, or even pointed wings, which project far over the elytra; disk of thorax dull, simply granulate, not or scarcely punctured." It will be seen that most of the darker specimens approach rather than comply completely with this definition.

Across the Allegheny Mts., *S. elevatus* varies similarly in color, but whatever the color, the variation in form takes an opposite direction, the hind angles being flattened down and broader, the whole insect shorter, broader and flatter. The first name applied to this form was *flammeus* by Haldeman, the type coming from Marietta, Ohio, on the Ohio River, and opposite West Virginia. The description is short "Elytra pale brilliant violet, distinguished from *elevatus* by the wider prothorax and elytra and lighter color; profile flatter above when viewed laterally." The color described is unusual and led Dr. Leconte to redescribe the more usual form from the western states. The actual description appeared in 1848² under the name *flammeus* and *dilatatus* was substituted in 1853³ when Dr. Leconte discovered that his insect and Haldeman's were not identical. The

¹ Mon., p. 141.

² Ann. Lyc. Nat. Hist. N. Y., IV, p. 440.

³ Trans. Am. Phil. Soc., X, p. 398.

type locality for *dilatatus* is St. Louis, Mo., and the long description calls for a dark violet insect with coppery elytra, much wider than *elevatus* with the sides of thorax less elevated, exactly as shown in a number of specimens taken by Mr. H. G. Barber at Langdon, Mo. Dr. Roeschke treats *dilatatus* as a synonym of *flammeus* but it would be more cognizant of the described color of the elytra to consider it a variety.

Whether it be called simply *flammeus* or *flammeus* var. *dilatatus*, it will be seen that the form occurring west of the Allegheny Mts. differs sufficiently from that occurring east of the mountains to have required a name in the opinion of Haldeman, Leconte and Roeschke.

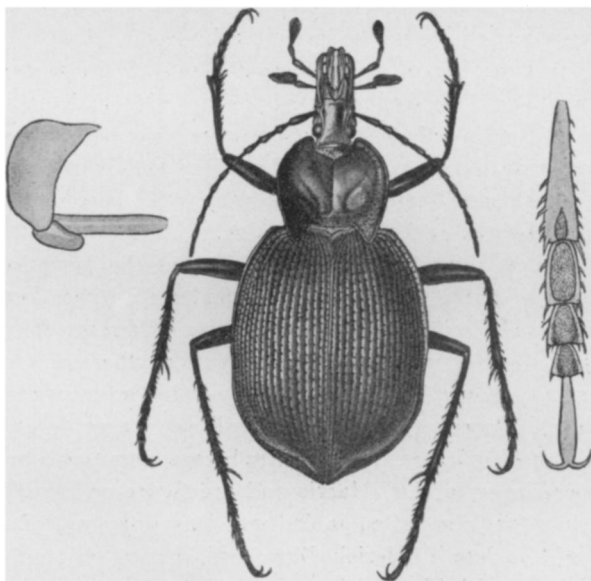
Coming now to the other species *S. unicolor* of which *heros* has been treated as a synonym, it is singular that though it also occurs on both sides of the Alleghenies, no such differentiation has hitherto been made. It differs from *elevatus* by its size (25-30 mm.), by the continuously arched elytra, the curve reaching from margin to margin without any flattening of the disk, by the seta of the posterior coxa being absent, and the first joint of the anterior male tarsi spongy pubescent at the tip only. These characters separate *unicolor* and its subspecies from *elevatus* and its subspecies; but, in addition it, like *elevatus*, possesses characters which vary, and these variations are similarly correlated with its distribution.

The greatest difficulty has long been that the sinuation of the lateral margin of the elytra a little behind the middle, first pointed out by Louis H. Joutel as the most obvious difference between this species and *elevatus*, and plainly evident in all the specimens I had seen, was not shown in the figure of *unicolor* or mentioned in the descriptions. Moreover, if one were willing to accept *heros* Harris as a synonym of *unicolor*, this difficulty became increased for the very careful description of Dr. Harris and the figure of *heros* given by Leconte in 1853¹ also failed to indicate this sinuation. During the lifetime of the late Frederick Blanchard, I took this point up by correspondence with him and he examined the Leconte collection and his own and wrote me "the lateral sinuation of the elytra is feeble or quite obsolete in most specimens." Either the species was variable in this respect or my observation and that of Joutel and others was at fault; or our eastern specimens were neither *heros* nor *unicolor*.

¹ Journ. Ac., IV, pl. 4, fig. 13.

Lately this difficulty has been dispersed by a comparison of the localities for the specimens which lack the lateral sinuation of the elytra, viz.: Ohio, Indiana, Kentucky, Tennessee, all west of the Allegheny Mts., with the type locality for *heros* given by Dr. Harris, "Ohio and Indiana," for it became plain that the specimens from the west, that are without the lateral sinuation, were the true *heros* and differed specifically from those from Washington, D. C., in which the lateral sinuation of the elytra is always well developed. Showing the material to Mr. Wm. T. Davis, he at once detected a further difference in the form of the thorax so I propose to add one more name to our list, dedicating it to the collector who has taken and distributed the largest number, by calling it *Scaphinotus shoemakeri* new sub-species.

This sub-species resembles *S. heros* but differs especially in the



greater approximation of the hind angles of the thorax which are separated in *heros* by 7 mm. making the sides of the thorax nearly parallel, while in *shoemakeri* the much higher and more reflexed hind angles approach each other within 5 mm., making the sides of the thorax somewhat convergent; as well as in the lateral sinuation of

the elytral margin mentioned above. The complete description is as follows:

Scaphinotus shoemakeri new subspecies.

Black, with a dark violet shade, elytra violet; ovate, margin of thorax strongly reflexed, hind angles extending over the elytra, disk in part coarsely punctured; elytra with punctured striae, humeral angles rounded, with the margin elevated, lateral margin becoming gradually less elevated towards apex, interrupted behind the middle by a shallow emargination, as if to make a recess for hind femora. Head black, rim punctured, feebly wrinkled behind the eyes with an acute carina, strongly elevated at base of antennae; thorax black, tinged with violet, coarsely punctured at apex, base and in the angles formed by the reflexed margins, which are strongly elevated so that the hind angles are separated by but five millimeters, while the thorax at its widest portion measures eight millimeters; the edge is only moderately thickened; elytra ovate, short, slightly but continuously convex, violet, deeply striate, the 15 or 16 striae strongly punctured, towards tip and behind the subapical umbone the striae become obsolete and the punctuation confused; the lateral margin is strongly elevated at humeri and gradually descends in height, becoming almost obsolete at apex; a little behind the middle it is interrupted by a sinuation. Beneath black, the inflexed portion of elytra coarsely punctate, the body beneath feebly punctulate, thorax and abdomen impunctate.

Male.—Tip of first tarsal joint, and all second, third and fourth joints spongy pubescent beneath; last ventral segment transversely concave, feebly wrinkled and with three setigerous punctures on each side of apex. Length, 25–30 mm. Width, 13–15 mm.

This subspecies probably inhabits many suitable localities east of the Allegheny Mts. The type and about fifty more specimens I have seen come from Washington, D. C., and its vicinity in Virginia and Maryland collected by Mr. Shoemaker and Mr. Davis. Mr. Shoemaker tells me the largest number were taken in Virginia under stones, logs and leaves or in bait bottles along the Potomac River above the free bridge, along the path or beside it and especially under stones about a spring. The path passes through dense woods near the foot of a steep hill. Fewer were taken in Maryland, along the bank of the stream above the Cabin John Bridge, and a few have also been taken along Rock Creek and in Rock Creek Park in the District of Columbia. The localities are all heavily wooded and abounding in snails. The dates of capture are principally September but specimens have also been found in June and August. The figure has been drawn from the male by Ernest Shoemaker; it represents the insect twice life size and the underside of the anterior tarsus still more enlarged as well as the posterior coxa.

As to the synonymy of *S. unicolor* Fab. and *S. heros* Harris, first announced by Dr. Leconte, a few words may be added. The type of *unicolor* is said to be in Glasgow, where it was last examined by Schaum,¹ who endorsed Dr. Leconte's opinion that the two were synonymous, but only states that *unicolor* is a splendid big *Scaphinotus*. Olivier figures² *unicolor*, the figure representing, according to Roeschke, a female of 29 mm. length, which in respect of size agrees with *heros*. This figure also agrees with *heros* in the form of the thorax and in the absence of lateral sinuation of elytral margin; but *heros* being apparently confined to the region west of the Allegheny Mts., one cannot accept the synonymy of *unicolor* and *heros* without assuming that the Fabrician type came in 1787 from a region then populated by Indians and scarcely ever visited by white men. It seems more probable that the type of *unicolor* came from the Southern Atlantic states, whence most of the early American material was sent to Europe. For a time the name *unicolor* was used for the large dark variety of *elevatus* found in the southern states, and a reëxamination of the type may revive that view, which was indeed first suggested by Fabricius himself. The weight of authority, however, Schaum, Leconte, Roeschke, and the measurement indicated by Olivier's figure, support the accepted synonymy; and since *shoemakeri* cannot be reconciled with the description and figure and *heros* comes from too improbable a locality I prefer to cite *unicolor* as the species and *shoemakeri* and *heros* as subspecies, separated structurally and geographically as stated. The status of *unicolor* must, in spite of the authorities, remain doubtful until the type can be reëxamined and compared with *shoemakeri*; but in any event the name *heros*, proposed by Dr. Harris for the Ohio and Indiana form, must be revived as a species, if *unicolor* proves to be a race of *elevatus*, or as a subspecies if the type of *unicolor* proves to be possessed of the characters ascribed to that species.

¹ Stett, *Ent. Ztg.*, 1848, p. 335.

² Ent., III, No. 35, pl. 6, fig. 62.